PROCEEDINGS

OF THE

SCIENTIFIC MEETINGS

OF THE

ZOOLOGICAL SOCIETY OF LONDON.

January 13, 1863.

George Busk, Esq., F.R.S., F.Z.S., in the Chair.

Dr. P. L. Sclater called the attention of the Meeting to two rare Fruit-Pigeons living in the Society's Menagerie, both of which he believed to be new to the collection. They had been obtained by purchase from a dealer, and were stated to have come from one of the "South Sea Islands." The species appeared to be *Carpophaga microcera*, Bp., and *Ptilopus fasciatus*, Peale—both of the Samoan Islands, in which group, according to Mr. Peale*, these two Pigeons were frequently kept domesticated by the natives, and carried about in a singular way, upon perches placed at the ends of long stakes.

Mr. W. B. Tegetmeier exhibited a singular variety of the Domestic Fowl, in which the webs of the feathers were broken up into minute filaments.

Mr. Leadbeater exhibited specimens of eggs of a species of *Rhea* (supposed to be those of *Rhea darwini*), obtained by Mr. E. W. Goodlake in Patagonia.

The following letter, addressed to the Secretary by Capt. J. H. Speke, commanding the East-African Exploring Expedition, was read to the Meeting:—

"Kazeh, Africa, February 17, 1861.

"Sir,—I have the honour to forward by down-caravan a few specimens of the fauna of this country, collected by the expedition

* Cassin's 'Mammalogy and Ornithology of the United States Exploring Expedition,' p. 264.

under my command,—they are enumerated below,—and to request, as noticed by my former letters, that you will have them kept in a separate department of the Society's house for me until my return from Africa, when Capt. Grant, my assistant, with myself, will be able to explain the peculiarities of the various animals to you. This lot includes, with those I first sent from Zanzibar, eight packages in all. Most of them have been sent off in the greatest hurry, and consequently without any arrangement, in the hands of passing travellers or caravans; but as they have all been consigned to the care of Mr. Frost, medical officer at Zanzibar, who has kindly offered to officiate for me in sending such things to England, I have no doubt but that they will reach you in very fair order for describing. They affect to nothing else; for it is next to impossible to stuff and take care of animal-specimens properly when travelling with a large caravan, destined for a long journey, and in constant motion. You must therefore take them as you find them, for the present; but I hope they will interest you sufficiently to direct your attention more particularly to these regions; for I am convinced in mind that the great varieties of animal life, large and small, which are to be found here would fully repay any trouble or expense in procuring, and the Society would do well if they could find competent men who would voluntarily spend a few years in collecting them. By far the richest fields for sport, or any kind of animal-collections, which have come under my notice are the regions in and about the East Coast range, but more particularly so near the Kingani and the Wami Rivers, where those streams issue from the range, and trend through beautiful parks and forests. This part should be attended to first, as, by being near the coast, transport would be easy, and the expenses of living a mere trifle.

"To give you some notion of the variety of larger animals which have been observed by the East-African Expedition, I will enumerate them, making notes, and even marks of interrogation, so (?), when I feel in doubt about their identity:—

"1. The Elephant (*E. africanus*) seems general everywhere in the hills or plains.

"2. Rhinoceros. The only variety, from the coast to Ungamwezi, which has been shot or seen is the common black *Rhinoceros bicornis* of the south,—not the Ketloa; but we hear of the White Rhinoceros in the Karagwah Mountains to the north.

"3. Hippopotamus, general.

"4. Pig. This is a very peculiar animal. The boar has four tubercles on the face; but the sow has only two, on the point of the cheek-bones below the eyes. I send sketches of them. Although we have met this pig everywhere on the line of march, we have seen no other variety. [This seems to be a species of *Phacochœrus*.—P. L. S.]

"5. Giraffe, general.

"6. Zebra, general; they make a kind of noise when excited, something like a sheep trying to bleat with a bad cold and cough.

"7. Buffalo (*Bos caffer*), general.

"8. Eland (*Oreas* sp.?). The only specimen shot was in the hill

range; but I believe them to exist, in the interior, on the plateau also. This beast was about the size of a Delhi ox; it has black points, and a broad black band strongly marked on the hinder part of the fore legs, just above the bend of the knee: another peculiarity is that it has white narrow stripes running down the flanks, over the ribs. [No doubt Dr. Livingstone's new species of Eland figured *from recollection* in his Travels?—P. L. S.]

"9. Koodoo? I have certainly knocked some of these animals over, although I never succeeded in bagging one. This was at Usekhe in Ugogo, and there also I have seen their horns and skulls lying on the ground. They appear to go up and hide in small hills covered with bush during the daytime.

"10. Water-Boc, common in the lower lands.

"11. Hartebeest, common.

"12. Brindled Gnu, only seen on the east side of the coast range; they exist there in herds of hundreds.

"13. Bubal? This cream-coloured beast I have followed and wounded, though never killed; it appears larger than the Hartebeest, though somewhat like it in shape and horns. Its characteristic marks are single black patches on the middle of its flanks; and the tail is tipped black. Seen in Dhoors, on the East Coast range, and on the interior plateau.

"14. Pallah (pronounced P'hallah by the Wangamwezi) is one of the commonest animals in this part of Africa; many have been shot, but some appear much larger and of lighter red than others.

"15. *Antilope scemmerringii*? This elegant creature (if it is the

animal I have named it) was only shot in Ugogo. It is about the

size of the Black Buck of India, and carries itself much in the same way; the female has fine horns*.

"16. Reh Boc, only one specimen shot, in the East Coast range.

"17. Bush-Boc? Seen in the lowlands in thick bush, but never killed.

"18. Duyker Boc, common on the interior plateau.

"19. Stein Boc, common.

"20. *A. saltiana*, common.

"21. Small Boc. This diminutive animal is a trifle darker than a common water-rat; it has short straight horns like the *A. saltiana*, but it is not above one-quarter of that size. I have seen the animal alive in the jungle, and have had a skin of one, but never obtained this Antelope entire.

"22. Zanzibar Boc.

"23. Strange Boc. The only specimen obtained of this was sent home; and as that was young and looked like a small red calf, more than anything else, I will leave it for future reference.

"24. *A. saltatrix*. This little Klipspringer was only shot in one place, on some rugged granitic outcrops in the interior plateau.

"25. Lion heard everywhere, but never seen.

"26. *Hyæna crocuta*, the common scavenger of the country.

"27. Variegated Hyæna. The size and shape of a large Wolf, long large ears; gallops fast, and in packs, and barks like a dog, for which cause it is called the Jungle-Dog by the natives. Three rushed out of the bush, with loud barks, one day to attack me; but they pulled up and went to the right about as soon as I turned round to shoot at them.

"28. Silver Fox, common.

"29. Small dark-brown Fox, very large ears and black points.

"30. Wild Cat.

"31. Ruddy Lynx.

"32. Hyrax.

"33. *Mungos fasciatus*.

"34. Squirrel.

"35. Yellow Ferret.

"36. Dark Chestnut Ferret.

"37. Hares, 4½ lbs. weight.

"38. Rats, in many varieties.

"39. Mice, the same.

"40. Moles, peculiar.

"41. Hedgehog.

"42. Tortoise, two varieties.

"I may remark that I have not seen in the part of the hill range traversed by this expedition the same peculiar four-horned Antelope which I once saw in the Usumbara Mountains, a little to the northward; and further, I feel convinced that I have seen the prints and

[* There seems little doubt about this Antelope (of the horns of which Capt. Speke sends a sketch—see Woodcut) being new. Dr. Gray is of this opinion.—P. L. S.]

other signs of large and small Antelopes which have not been shot by the expedition, and so also of other animals not considered game, by which it will appear that there is much left for the naturalist or sportsman to bring up on this branch of natural history alone, to say nothing of the birds, reptiles, and insects which, by closer examination than I was formerly able to devote to it, I can now venture to say comprise a variety of genera and species so great as few other countries can boast of. There are, however, but few birds of prey; and the other birds, though of great variety, are seldom to be found of gaudy plumage. The game-birds too are not so numerous as those usually classed as common birds, and, as far as my experience goes, I may enumerate them as—

"1. The Ostrich.

"2. Bustard.

"3. Three varieties of Floriken: of these, specimens of two sorts have been sent home; and the third one is a larger bird with a black body and white wings, something resembling the common large Floriken of Bengal.

"4. Three different species of Partridge.

"5. Two sorts of Guinea-fowl.

"6. Quails, Common and Bush.

"7. Geese.

"8. Ducks.

"9. Snipe.

"Of Snakes, poisonous as well as other ones are not uncommon, and in some places very numerous. Lizards comprise an interesting variety; whilst the Insectivorous birds are of all descriptions, and in vast numbers."

Continuation of the above letter.

"Kazeh, 10th March, 1861.—Since writing the above letter I had reason to believe that two species of Antelopes, which I had not met with, were to be found in the jungles not far distant from this—the Sable Antelope and the Blau-Boc. I accordingly went there, and have now satisfied myself of the existence of both by personal inspection. The Sable Antelope appeared very scarce, for in six days' constant shooting I only saw one; but the Blau-Bocs were more common. The specimen of this latter animal which I send you was pulled down by Lions after the forearm had been broken by a bullet.

"Kazeh, 7th May, 1861.—I have just returned from Mininga to this place, and find, to my surprise, that I never concluded this letter (by attaching a list of the birds and animals) before the expedition departed. I now cannot do so from memory, the specimens being in most part encased in tin; but I am adding twenty-two birds and one Wild Cat to the collection. There are also a few rough sketches which I should like you to keep for me, painted on nine separate sheets of block-paper. It is now more than six weeks since the expedition left Kazeh; and in that time I find all the large birds, Vul-

tures, Falcons, Hawks, &c., have been so much destroyed by insects that I have thought it better to throw them away.

"I remain, Sir,

"Your obedient servant,

"J. H. SPEKE,

"Captain Commanding E. African Expedition."

"P.S. A Leopard was shot here last night."

"*P. L. Sclater, Esq.,*
Secretary, Zoological Society,
London."

The following papers were read:—

1. CONTRIBUTIONS TO THE KNOWLEDGE OF THE BRITISH CHARRS. PART II. By ALBERT GÜNTHER, M.A., PH.D., M.D., F.Z.S.

(Plates I. & II.)

Since the publication of my first paper on this peculiar group of *Salmonidæ**, I have received very valuable materials for prosecuting my researches. The additional specimens show that I have been correct in distinguishing the three British species from those of the Continent and from one another, and that the differences between the young and mature fish of one species may be apparently greater than between individuals of the same age but of two distinct species—the laws according to which the changes in the external form proceed from the young to the mature age appearing to be the same in the different species, as far as our present experience goes. It has been observed, in allied species of insects, that, whilst the perfect animals are so completely alike as to be scarcely distinguishable, their larvæ are very different in their external characters, and even in their habits. This is not the case with the Charrs: the young individuals of two species differ as much from each other as the old ones. But in order to find out the distinctive characters of two species, it is always necessary to compare specimens of the same age. This can be ascertained by the examination of the generative organs, by the development of the jaws, and finally by comparison of a series of examples from the same locality, assisted by actual observation or information from persons who have been for years acquainted with the Charrs of a certain locality, and know to what size they attain there.

Among mammals and birds, difference in the size of full-grown animals is admitted as a specific character, whilst ichthyologists have scarcely ever used it as a distinction between closely allied species, because numerous fishes continue to grow for an almost indefinite period after they have attained to maturity. However, if we should be able to ascertain for a series of fishes the age or the size at which they *first* attain to maturity, the differences observed might be of as

* Proceedings of this Society, 1862, p. 37.

J. Jury, lith

M & N. Hanhart, Imp.

SALMO NIVALIS, *juv.*

J. Jury lith.

M. & N. Hanhart Imp.

SALMO COLII

great value for the distinction of the species of fishes as in the higher classes of vertebrate animals. I have been induced to make these remarks by the fact (to which we shall recur in the progress of this paper) that the *Salmo alpinus* of Scotland attains maturity at a size inferior to that of an immature Swedish *Salmo alpinus*. Now, if such a difference in the size should be considered as a specific character at a future time, the Scotch and Swedish fishes would be separated.

The specimens which I have examined since the publication of the first paper are the following; they have been deposited in the Collection of the British Museum :—

a. *Salmo salvelinus*, Nilss.

A large male specimen from the Lake of Wettern; presented by Professor Liljeborg.

b. *Salmo alpinus*, L.

A young male from Lapland; presented by Prof. Liljeborg.

Four adult males from Quickjock (Lapland); sent by Mr. Wheelwright.

Two immature specimens from Lake Helier in Hoy, Orkneys; presented by Dr. W. Traill.

Five adult specimens, males and females, from Scotland; purchased of Mr. Stevens.

c. *Salmo willughbii*.

Many mature male and female specimens from Loch Bruiach; presented by Lord Lovat.

d. *Salmo nivalis*.

Two very fine immature specimens; presented by G. G. Fowler, Esq.

e. *Salmo grayi*.

Many adult males from Lough Melvin; presented by the Earl of Enniskillen.

An adult female; purchased of Mr. Stevens.

f. *Salmo colii*, n. sp.

Many specimens from Lough Eske; presented by the Earl of Enniskillen and by T. Brooke, Esq.

A female specimen from Lough Dan, co. Wicklow; presented by R. H. Scott, Esq.

Before proceeding to the detailed remarks on these six species, I must express my best thanks to the gentlemen mentioned for their assistance, which was accompanied by much valuable information.

a. *Salmo salvelinus* (L.), Nilss.

Diagnosis, taken from a male specimen from the Lake of Wettern, 17 inches long.—Body slightly compressed and elongate, its greatest depth being contained five times and a half in the total length (to

the end of the middle caudal rays). The length of the head exceeds the height of the body, being contained four times and a half in the total; it is rather more than one-half of the distance between the snout and the vertical from the origin of the dorsal fin. The maxillary extends beyond the orbit in the adult fish. Eye rather small, its diameter being less than one-half of the interorbital space. The length of the pectoral fin of the mature fish is equal to, or less than, one-half of the distance of its base from the root of the ventral. Dorsal rays fourteen*; the length of its longest ray is much less than that of the pectoral, and not much more than one-half of the length of the head; the length of its base is twice that of its last ray. 190 transverse series of scales above the lateral line. Vertebræ 65. Teeth of moderate size.

This species is not represented by any of the British Charrs that I have examined. The Irish Charrs form quite a distinct group, the characters of which I shall point out hereafter. *S. willughbii* and *S. cambricus* have larger scales, much longer pectoral fins, and differ besides in many other points. *S. alpinus* has the same number of scales; but in specimens of a corresponding age and size the pectorals are much longer, the maxillary is less developed, &c. The Iceland Charr has the dorsal fin much more elevated. This Swedish *S. salvelinus* may be identical with a part of the specimens comprised by Heckel under the same name.

b. *Salmo alpinus*, L.

Diagnosis.—Body slightly compressed and elongate, its greatest depth being one-fifth or one-sixth of the total length (to the end of the middle caudal rays). The length of the head equals the height of the body in mature specimens, but is somewhat more in immature; it is two-ninths or one-fifth of the total; it is rather less than, or equal to, one-half of the distance between the snout and the vertical from the origin of the dorsal fin. The maxillary extends but little beyond the orbit in the fully adult fish. The eye is one-half, or rather less than one-half, of the width of the interorbital space. The length of the pectoral of the mature fish is more than one-half of the distance of its base from the root of the ventral; in immature specimens its length is considerably less. Dorsal rays thirteen; the length of the longest ray is much less than that of the pectoral, and three-fifths or one-half of the length of the head; the length of its last ray is a little more than one-half or two-thirds of the length of its base. 195–200 transverse series of scales above the lateral line. Vertebræ 62 in the Scandinavian variety, and 59 in the Scottish. Teeth of moderate size.

At the time when I first compared the Charrs of Windermere and Llanberris† with Linné's and Nilsson's descriptions of *Salmo alpinus*, I had not had the opportunity of examining specimens from Lapland. Now, having specimens before me which, in all probability, are identical with the species described by Linnæus and Nilsson, I see

* Including the rudimentary rays in front of the fin.

† Proc. Zool. Soc. 1862, p. 39.

that I have misunderstood a part of the description of the former, and that the latter has given his notes from young specimens. When Linnæus says that the head of his specimen (12 inches long) was 1½ inch, he measured only the top of the head from the end of the snout to the occiput; whilst ichthyologists of the present time take the lateral length of the head from the end of the snout to the gill-opening. Nilsson says that *S. alpinus* has shorter pectoral fins than *S. salvelinus*; this is correct if we examine specimens of the former only 8–10 inches long, but in a mature state *S. alpinus* has the longer pectorals. Therefore the characters by which I have formerly distinguished the *S. alpinus* from *S. willughbii* and *S. cambricus* cannot be retained, whilst others, affording easy specific distinctions, become evident on comparison of actual specimens. The two British species mentioned have a less number of transverse series of scales; *S. willughbii*, besides, has the body more elevated, whilst *S. cambricus* has a longer head, and the base of the pectoral overlapped by the gill-cover apparatus. The Iceland Charr, again, differs from *S. alpinus* in its elevated dorsal fin.

I have mentioned above that I refer to this species a number of specimens from Lapland, Scotland, and from the Orkneys. After having hesitated for a long time, I prefer doing so, as they certainly are more closely allied to one another than to any of the other forms. Future observations on a more perfect series than that which I have at present, and especially an examination of a greater number of immature and of very old specimens, will settle this point. The specimens from Scotland and Lapland appear to agree in almost every point of importance, but in the number of vertebræ and in the size: whilst the Lap Charr does not attain to maturity before it has attained to a length of 12–13 inches, the Scotch individuals are mature at a size of 9 inches. The specimens from the Orkney Islands are 6 inches long, and apparently correspond in age to a Lap specimen of 10 inches in length. The immature state of *S. alpinus* of both countries is distinguished by short pectoral fins; but, whilst those fins have attained to their full relative length in Scotch specimens of 9 inches in length, the Lap specimens are 13 inches long at the same period. Other differences may be observed on comparing these young Charrs, especially in the form of the head, which is considerably less elongate in the Scotch individuals; but in order to ascertain whether this character is constant, it would be necessary to compare a greater number of specimens than I have at present.

I shall first describe one of the mature specimens sent by Mr. Wheelwright from Quickjock.

Description of a male specimen, length 13 *inches* 8 *lines*.—Head and body compressed, but slightly elevated; its greatest depth is below the origin of the dorsal fin, where it is *one-fifth* of the total length (to the end of the middle caudal rays). The least depth of the tail is rather less than the length of the base of the dorsal fin. The height of the head above the mandibulary joint equals the distance between the posterior margin of the orbit and the end of the operculum. The top of the profile of the head is somewhat elevated

above the margin of the orbit, the diameter of which is nearly one-sixth of the length of the head, two-thirds of the extent of the snout, and rather less than one-half of the width of the interorbital space; the latter is convex, with a rather prominent ridge along the middle, and with a pair of series of pores. Snout compressed, conical, with the jaws equal anteriorly. The *maxillary* extends to the vertical from the hind margin of the orbit; in the two largest specimens (15–17 inches long) it reaches slightly beyond that vertical. It is armed with 20–22 *teeth* of moderate size; six teeth in each intermaxillary, fifteen in each mandible; three pairs on the vomer, arranged in two longitudinal series slightly converging behind; nineteen on each palatine bone, and six pairs on the tongue. *Operculum* obtusely rounded behind, its length being two-thirds of its height; the suboperculum projects but little beyond the hind margin of the opercle, its vertical width being one-half of that of the operculum.

D. 13. A. 12. P. 13. V. 10.

The origin of the dorsal fin is a little nearer to the end of the snout than to the root of the caudal; *the length of its base is one-third more than that of its last ray, and contained once and a fourth in that of the fourth ray.* The fifth and sixth rays form an acute point, and the upper margin of the fin is straight. The first ray is rudimentary, the second half the length of the third, the third two-fifths the length of the fourth, the fifth simple, the sixth branched, the last split to the base. The distance of the adipous fin from the dorsal is but little more than twice the base of the latter.

The origin of the anal fin is exactly in the middle between the root of the caudal and that of the outer ventral ray; the length of its base is somewhat less than that of the dorsal, and is contained once and a fourth in the length of the fifth ray.

Caudal fin forked, one of the middle rays being two-fifths as long as the outer ones, the length of which is contained six times and a half in the total; lobes pointed.

The base of the pectoral is entirely free, and not overlapped by the gill-cover apparatus; *it terminates at a considerable distance from the vertical from the origin of the dorsal,* equals the length of the head without snout, *and is contained once and a third in the distance between its root and that of the ventral.*

The ventral is inserted below the middle of the dorsal.

A specimen, 12 *inches long,* from the same locality, agrees very well with the one first described; its operculum, however, is as long as high, and the length of the pectoral fin is nearly one-half of the distance between its root and that of the ventral.

An immature specimen, 10 *inches long,* differs widely from the preceding, its body and its head being much more elongate. The length of the head is more than the height of the body, the former being one-fifth, the latter one-sixth of the total length; the operculum is longer than high, and the height of the head above the mandibulary joint is less than the distance between the posterior margin of the orbit and the end of the operculum; the maxillary ex-

tends nearly to the vertical from the hind margin of the orbit. The length of the pectoral fin is considerably less than one-half of the distance between its root and that of the ventral.

With regard to the coloration, this species does not differ from *S. willughbii*; the immature specimen has the sides silvery, and the red of the lower parts is replaced by a slight tinge of orange-colour.

Some of the specimens from Quickjock had the stomach filled with food, which consisted of specimens of small species of *Planorbis* and *Limnæa*, of *Ephemerides*, of the larvæ of *Libellula*, and of small fresh-water Crustacea. The number of pyloric appendages is forty-four.

The largest of our *Scotch* specimens is a mature male 11 inches long. It differs from the male from Quickjock in having a more elongate body, the depth of which is one-sixth of the total length. The operculum is as high as long; the pectoral fin terminates at a considerable distance from the vertical from the origin of the dorsal, equals the length of the head without snout, and is contained once and a quarter in the distance between its root and that of the ventral. The *females* do not differ from the males. The *immature specimens* have the same short pectorals which we have found in the young Lap Charr; but the operculum is much less elongate.

The stomach of the Orkney Charr contained large common earth-worms (*Lumbricus*).

We distinguish, therefore, one of the Scotch Charrs by the name of *Salmo alpinus*, which, although not entirely agreeing with a Charr from Lapland described by Linnæus under the same denomination, is nevertheless closely allied to it,—the Scotch variety being considerably smaller in size at the period of first maturity. This Scotch species is found in Lake Helier in Hoy, Orkneys, and very probably in certain other lochs of Scotland*.

c. *Salmo willughbii*.

This species has been described and figured in the former paper as the Charr of Windermere. A Charr for the knowledge of which I am indebted to Lord Lovat is very closely allied to it. It is found in Loch Bruiach (North Scotland); all the specimens sent are of nearly equal length, of between 7 and 8 inches; nevertheless they are mature, and the development of the milt and ova indicates that their spawning-season is the end of October. Lord Lovat writes that "those specimens are smaller in size than usual; but they are the largest we have caught this season."

This Charr of Loch Brniach differs but slightly from the typical *S. willughbii*; it is somewhat more elongate; it has thirteen dorsal rays, the base of the dorsal fin being rather longer than the last dorsal ray. The number of vertebræ is sixty or sixty-one, and that of the pyloric appendages is thirty-five.

* The specimens purchased of Mr. Stevens for the collection of the British Museum are from Scotland; but the exact locality whence they have been procured is unknown.

d. *Salmo nivalis. Iceland Charr.* (Pl. I.)

In the original description of *S. willughbii* (p. 48) I mentioned several specimens of a Charr from Iceland, which were not fit for an accurate examination, owing to the manner in which they had been preserved. Meanwhile I have received from Mr. G. G. Fowler two very fine examples of the same species, which, although young (10 inches long), prove that it is distinct from the other European Charrs. It is probably identical with the dark variety of *S. alpinus*, mentioned by Faber (Fische Islands, p. 169), for which he proposed the name of *S. nivalis*, if some future ichthyologist should point out its distinctive characters.

Diagnosis.—Body slightly compressed and elongate; its greatest depth equals the length of the head, and is one-fifth, or somewhat less than one-fifth, of the total length; the length of the head is rather more than one-half of the distance between the snout and the vertical from the origin of the dorsal fin. The maxillary extends beyond the orbit in the adult fish (15–20 inches long). The eye is less than one-half of the interorbital space in the adult fish. The length of the pectoral fin is, in mature and immature specimens, more, or much more, than one-half of the distance of its base from the root of the ventral. Dorsal rays fourteen; the length of the longest ray equals that of the pectoral, or that of the head without the snout; the length of the last ray is two-thirds of the length of the base. 190 transverse series of scales above the lateral line. Vertebræ 62. Teeth of moderate size.

Pyloric appendages 41. Specimens from 10–12 inches long are still immature. The stomach of one contained numerous very small freshwater bivalves.

e. *Salmo grayii.*

The Earl of Enniskillen has sent several very fine specimens of this species from Lough Melvin for the collection of the British Museum; they were all males, and perfectly like, even in size, those from which I have taken my description. A few of them showed the red of the belly of a deeper hue than the individual figured. A female fish, however, has been discovered among a collection of *Salmonidæ* purchased of Mr. Stevens: this specimen does not differ from the males; but the colours have disappeared, the specimen being preserved in spirits. The eggs are of the size of a hemp-seed.

The number of pyloric appendages is thirty-seven; and that of the gill-rakers of the lower branch of the outer branchial arch varies from nine to thirteen.

f. *Salmo colii*, n. sp. *The Charr of Lough Eske.* (Pl. II.)

In the former paper on Charrs (p. 53), I mentioned several Irish specimens, the property of the Museum at Belfast, said to be *perhaps* from Lough Melvin. I then doubted the accuracy of the "habitat," as those specimens, although allied to the Charr of Lough Melvin, differed in several not unimportant points from the types, and as they evidently belong to a very small species which is mature at a

size of 5 inches. Owing to the kind assistance of the Earl of Enniskillen and of Th. Brooke, Esq., I have been able not only to ascertain the exact locality where those specimens are found, but also to determine the characters of this new species (for such has the Charr of Lough Eske proved to be); and I name it after that nobleman, who has taken untiring interest in these researches.

Salmo colii is not confined to Lough Eske; a specimen procured by R. H. Scott, Esq., from Lough Dan, agrees in every respect with the Charr of Lough Eske. The following description, given strictly in accordance with that of *Salmo grayii*, will show the distinctive characters on which this species is founded:—

Body slightly compressed and rather elongate, its greatest depth being contained four times and three-fifths or five times in the distance of the snout from the end of the middle caudal rays. The length of the head is one-half of the distance between the snout and the vertical from the origin of the dorsal fin. Head compressed; interorbital space nearly flat, its width being less than twice the diameter of the eye. Jaws of the male of equal length anteriorly; *teeth very small*, four to six in each intermaxillary, fourteen to seventeen in each maxillary. Pectoral shorter than the head, terminating at a considerable distance from the origin of the dorsal and of the ventral. Dorsal rays fourteen. 160 transverse series of scales above the lateral line.

Description of a male and female specimen, $7\frac{3}{4}$ inches long.—Head and body slightly compressed, not elevated, the greatest depth being below the origin of the dorsal fin, where it is contained four times and three-fifths (female) or five times (male) in the total length (to the end of the middle caudal rays). The least depth of the tail is considerably less than the length of the base of the dorsal fin. The height of the head above the mandibulary joint is more than the distance between the posterior margin of the orbit and the end of the operculum. The top of the profile of the head is scarcely elevated above the margin of the orbit, the diameter of which is one-fifth of the length of the head, somewhat shorter than the snout, and two-thirds of the width of the interorbital space; the latter is but very slightly convex, with a very indistinct ridge along the middle. The nostrils are situated midway between the end of the snout and the orbit. The maxillary extends scarcely to the vertical from the posterior margin of the orbit, and is armed with from thirteen to seventeen very small teeth. All the other teeth are small; four to six in the intermaxillary, fifteen in each mandible, three on the vomer, fifteen on each palatine, and four pairs on the tongue. The suboperculum forms the hindmost part of the gill-covers, and does not cover the exposed portion of the humerus above the root of the pectoral; its vertical width is one-half of that of the operculum.

D. 14. A. 12. P. 13. V. 9.

The origin of the dorsal fin is a little nearer to the end of the snout than to the root of the caudal; the length of its base is considerably more than that of the last ray, and contained once and a

third in that of the fourth ray; the upper margin of the fin is straight. The first ray is nearly half as long as the second, the second and third half as long as the third and fourth; the fifth, sixth, and seventh are the longest, the former simple, and the two latter branched; the last is split to the base, and half as long as the sixth. The distance of the adipous fin from the dorsal is equal to, or rather less than, twice the length of the base of the latter.

The origin of the anal fin is in the middle between the root of the caudal and that of the outer ventral ray; the length of its base is less than that of the dorsal and two-thirds of the length of the fifth ray. The fourth, fifth, and sixth rays are the longest, and form an acute point; the lower margin of the fin is slightly emarginate. The fourth ray is simple, the fifth branched; the last is split to the base, half as long as the fourth.

Caudal fin forked, one of the middle rays being two-fifths as long as the outer ones, the length of which is less than one-fifth of the total. Lobes pointed.

The base of the pectoral is entirely free, and not overlapped by the gill-cover apparatus; it is shorter than the head, terminating at a considerable distance from the vertical from the origin of the dorsal; its length is one-half, or not much more than one-half, of the distance between its root and that of the ventral.

The ventral is inserted below the tenth and eleventh dorsal rays, its length being four-fifths of that of the pectoral, and two-thirds of that of the head.

Back bluish black; sides silvery, with scattered light salmon-coloured dots; belly reddish; fins black, the anal and the paired fins with a reddish tinge, the anal and the ventrals with a narrow whitish margin.

Number of vertebræ 63.

This is evidently one of the smallest species of this genus; it is mature when it has grown to a size of 5–6 inches, and, according to inquiries made by the Earl of Enniskillen, it never exceeds the length of the specimens described, viz. 7–8 inches. The locality where it is found is Lough Eske, a small lake in the county of Donegal, the circumference of which is not above eight miles. Mr. Brooke, whose family were residents on the shores of that lake for more than two centuries, writes that "Lough Eske (Eske, or Yesk, meaning Fish) was the crater of an extinct volcano, as suggested by Dr. Wilde, of Dublin; a high mountain-range runs close to the north-east shores. In the season, salmon, white trout, and the common lake-trout are in abundance. The Commissioners of Fisheries have decided that the Charr of Lough Eske are the *Salmo alpinus*, thus placing them in the same Act as salmon; so that, except for scientific purposes, we are not permitted to take them after August. Formerly, in the months of October and November the fish were taken in large quantities by the country-people, without any apparent diminution of their numbers. Now, at the permitted season of fishing they remain in such deep waters, the people have not nets sufficiently large to take them. The Charr are not at all like the only 'freshwater Herring' with which

I am acquainted, that of Lough Neagh*, the flesh of which is quite white; and the shape of the fish was like Sea-Herring."

Conclusion.

When we recapitulate the results of our examinations contained in this and in the preceding papers, we hope we have shown—

1. That three very distinct species of Charrs are found in Great Britain, namely, *S. willughbii* in the Lake of Windermere and in Loch Bruiach, *S. cambricus* in Wales, and *S. alpinus* in certain parts of Scotland.

2. That those three species differ by most constant characters from the *S. umbla* and *S. salvelinus* of the Continent; but that *S. alpinus* of Scotland is closely related to the *S. alpinus* of Lapland, differing merely by its smaller size when first attaining to maturity, and by the number of vertebræ.

3. That Iceland is inhabited by a distinct species (*S. nivalis*).

4. That the Charrs of Ireland form a separate group by themselves, distinguished by the feeble development of their dentition; and that the Charr of Lough Melvin (*S. grayi*) is a distinct species from that of Lough Eske and Lough Dan (*S. colii*).

In conclusion, I subjoin a synopsis of the species which I have examined up to the present time, observing, however, that this synopsis is given merely for the purpose of showing *a few* of the principal characters by which the *mature* individuals of the different species are distinguished:—

I. *Jaws well developed; teeth of moderate size.*

A. The length of the pectoral fin in the mature fish less than one-half of the distance between the roots of the pectoral and ventral fins.

1. Thirteen dorsal rays. Intermaxillary teeth much stronger than those of the maxillary. L. lat. 185. Lower parts silvery. *S. umbla.*
2. Fourteen dorsal rays; intermaxillary and maxillary teeth equal in strength. L. lat. 190. Lower parts red. *S. salvelinus.*

B. The length of the pectoral fin in the mature fish more than, or equal to, one-half of the distance between the roots of the pectoral and ventral fins.

1. The height of the body one-fifth or one-sixth of the total length; the height of the dorsal fin three-fifths or one-half of the length of the head. L. lat. 195–200. *S. alpinus.*
2. The height of the body one-fifth of the total length; the height of the dorsal fin equals the length of the head without snout. L. lat. 190. The gill-cover not overlapping the root of the pectoral. *S. nivalis.*

* Mr. Brooke evidently alludes here to the *Coregonus pollan.*

3. The height of the body one-fifth or one-sixth of the total length; the height of the dorsal fin two-thirds of the length of the head. L. lat. 170. The gill-cover overlapping the root of the pectoral. *S. cambricus.*
4. The height of the body one-fourth of the total length; the height of the dorsal fin equals the length of the head without snout. L. lat. 165. The gill-cover not overlapping the root of the pectoral. *S. willughbii.*

II. *Lower jaw very feeble; teeth minute.*

1. The pectoral extending to, or beyond, the origin of the dorsal fin. *S. grayi.*
2. The pectoral terminating at a considerable distance from the origin of the dorsal fin. *S. colii.*

2. On Atheris burtonii, a New Snake from West Africa. By Dr. Albert Günther.

(Plate III.)

A collection made by Major Burton, H. M. Consul in Fernando Po, during an excursion in the Camaroon country, contained several species of Snakes, namely, *Grayia triangularis*, *Dryiophis kirtlandii*, a brood of newly-born *Clotho nasicornis**, and, finally, a specimen of a Snake distinguished by its form, scales, and shields, and by a coloration which is almost unique in the whole order of Ophidians. I had named this genus *Pœcilostolus* (Ann. & Mag. Nat. Hist. Jan. 1863); but having since received the last part of 'Proc. Acad. Nat. Sc. Philad. 1862, I find that Mr. Cope has already proposed the generic name of *Atheris* for congeners of our species (p. 337).

Atheris.

Head thick, broad, triangular, covered above with strongly-keeled scales; body compressed; tail prehensile. Scales keeled. Subcaudal shields entire.

Atheris burtonii. (Pl. III.)

The head and neck are rough, in consequence of the keels of the single scales forming prominent spines. The rostral shield is very low, linear, with other scale-like shields above; nine upper labials. Nostril in the middle of a single subquadrangular plate, situated above the first labial; eye surrounded by a ring of subequal scales; chin-shields scale-like, keeled, except the anterior pair, which are smooth; the posterior labial shields of the lower jaw keeled. Scales

* There is also a specimen, in a very bad state of preservation, which appears to belong to *Neusterophis lævissima* (*Natrix lævissima*, Gthr.).

G.H.Ford

ATHERIS BURTONII

W.West. imp.

of the body in nineteen rows. Ventral shields 163; anal entire; subcaudals 58.

Entirely lemon-coloured; some greenish scales are scattered about on the upper surface of the body.

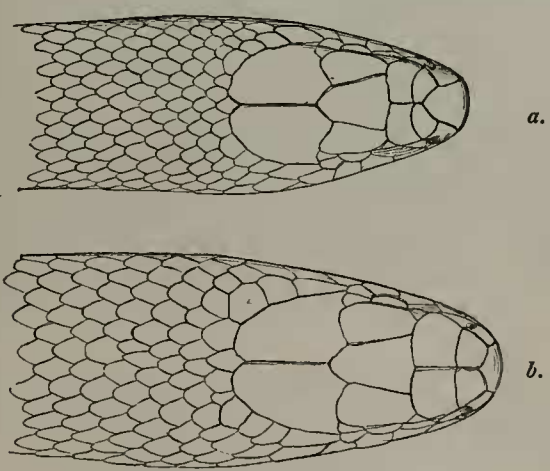
Total length 14 inches; head $\frac{2}{3}$ inch; tail $2\frac{1}{2}$ inches.

3. Note on Diemennia superciliosa. By Dr. A. Günther.

The Proceedings of this Society of last year* contain a very interesting observation of Mr. Krefft, of Sydney, according to which a small banded Snake, which he identifies with *Furina textilis*, Dum. & Bibr., is merely the young of a very large species, the adult of which is of a nearly uniform coloration. Mr. Krefft (who, for the benefit of the collection entrusted to his care, is very anxious to have his specimens identified with the types contained in European collections) has sent us an old and two young examples of this Snake; and having re-examined the species of *Diemennia* and the literature referring to them, I am enabled to settle some points on which doubts have been entertained.

The young specimens, then, found by Mr. Krefft do not belong to *Furina textilis*, Dum. & Bibr., which has three posterior oculars, but to *Diemennia annulata*, described by myself in the 'Catalogue of Colubrine Snakes,' p. 213; and the old individual sent by Mr. Krefft is identical with *Pseudoëlaps superciliosus*, Fisch. M. Jan, of Milan (who says that he has examined the Snakes of the Hamburg Museum), describes the adult Snake under two names, *Pseudoëlaps sordellii* and *Ps. kubingii*, the latter being founded on an accidental variety, in which some of the head-shields are confluent.

Mr. Krefft, in a letter addressed to me, alludes to *Pseudonaia nuchalis* as a species which, perhaps, might be identical with an old *Diemennia superciliosa*. These, however, differ *toto cœlo*, as may



a.

b.

* Proc. Zool. Soc. 1862, p. 149.

be seen from the description given by myself (Colubr. Sn. p. 227), and from the figures (*anteà*, p. 17), where fig. *a* represents the head-shields of *Pseudonaia nuchalis*, and fig. *b* those of *Diemennia superciliosa*.

The synonymy of this species, therefore, would be :—

Diemennia superciliosa.

a. *Adult*.

1856. *Pseudoëlaps superciliosus*, Fischer in Abhandl. Geb. Naturwiss. iii. p. 107, taf. 2. fig. 3 (head, not quite correct).

1859. *Pseudoëlaps sordellii*, Jan in Rev. & Mag. Zool. 1859, pl. C (head).

1859. *Pseudoëlaps kubingii*, Jan, *l. c.* (founded on an accidental variety).

b. *Young*.

1858. *Diemansia annulata*, Günth. Colubr. Snak. p. 213.

1862. *Furina textilis*, Krefft, P. Z. S. 1862, p. 149.

4. List of Birds collected in the Island of Bouru (one of the Moluccas), with Descriptions of the New Species. By Alfred R. Wallace, F.Z.S.

(Plates IV., V., VI.)

This collection of birds was made by myself during two months of the year 1861. It consists of *sixty-six* species, among which were no less than *seventeen* new ones. Of these, *three* were found about the same time in the Island of Sula, and, with a new *Pitta*, have already been described in the Society's 'Proceedings,' leaving *thirteen* to be described in the present paper.

In my paper "On the Birds of the Sula Islands," read before the Society at their last Meeting, I pointed out that the large proportion of purely Celebes forms found there forced us to the conclusion that a closer connexion had once existed between those islands and Celebes, and required us to class them as forming a single zoological group. The Island of Bouru must, on the contrary, be classed with the Moluccas; for, leaving out about *twenty* species of rather wide distribution, the remaining *forty-six* are all either identical with, or most nearly allied to, Moluccan species. Not a single characteristic Celebes form is found in Bouru; and there are only *three* birds in the island whose affinities seem rather with the Indian than the Australian region, viz. *Alcedo moluccensis*, *Hirundo javanica*, and *Treron aromatica*.

Bouru is therefore the western limit of the Moluccan fauna, and is the poorest portion of it, having several very remarkable deficiencies. *Lorius*, found in every other island of the Moluccas and New Guinea, is absent; *Cacatua*, found in every island of the Australian region, is also absent; and, stranger still, *Buceros* and *Corvus*, found in almost every large island of the archipelago, are both wanting.

M & N. Hanhart, imp.

FALCO RUBRICOLLIS.

M & N. Hanhart Imp

CEYX CAJELI

M & N Hanhart Imp

MONARCHA LORICATA.

With these exceptions, most of the Moluccan types are represented either by identical or allied species.

The following is a list of the new species now described, and of a few others which seem confined to Bouru :—

Tanygnathus affinis, n. s., Bouru and Ceram.
Accipiter rubricollis, n. s., Bouru and Ceram.
Athene hantu, n. s.
Tanysiptera acis, n. s.
Ceyx cajeli, n. s.
Pitta rubrinucha, Wallace.
Cisticola rustica, n. s.
Mimeta bouruensis (H. & J.).
Criniger mysticalis, n. s.
Monarcha loricata, n. s.
Rhipidura bouruensis, n. s.
Tropidorhynchus bouruensis, n. s.
Campephaga marginata, n. s.
Dicæum erythrothorax, Less.
Nectarinea proserpina, n. s.
Gallinula frontata, n. s.

All but the two first species in this list are confined to Bouru only, and they are mostly representative species of Moluccan forms. Besides these, the three species of *Pachycephala* are also, as far as the Moluccas are concerned, peculiar to Bouru; for though they are found also in Sula, they have evidently emigrated there, the Celebes group, to which Sula belongs, not possessing any species of the genus. The Island of Bouru may therefore be considered to have added *seventeen* new species, but not any new forms or genera, to the Moluccan avifauna.

Geoffroius personatus.

Psittacus personatus, Shaw.
P. bataviensis, Wagl. Mon. Psitt. p. 624.
Hab. Bouru, Amboyna, Ceram, Goram, Ké and Aru Islands.
Remarks.—The specimens from Bouru, and some from Ceram, are $12\frac{1}{2}$ inches long; that from the Aru Islands 9 inches; but I have a series of intermediate sizes, and can discover no differences of form or in the distribution of the colours. I must therefore consider Mr. G. R. Gray's *Psittacus aruensis* (P. Z. S. 1858, p. 183) as only a small variety of this species, and his *P. capistratus*, from the Ké Islands (*ibid.* p. 183), as a young male bird of the same species.

Eclectus magnus.

Psittacus magnus, Gm. S. N. i. p. 344.
Hab. Bouru and the other islands of the Moluccas and New Guinea.

Eclectus puniceus.

Psittacus puniceus, Gm.? (et auct.) Pl. Enl. 518.
Hab. Bouru, Amboyna, and Ceram.
Remarks.—This bird is sufficiently distinct from the *Psittacus grandis*, Gm., which is confined to the Gilolo group, in its smaller size, duller red colour, red under tail-coverts, and tail only orange-tipped, in place of the yellow under tail-coverts and larger yellow tail-band of *E. grandis*. Great confusion exists in the synonymy of the *Psittaci*, owing, I believe, to the fact of so many of these birds

having been described from specimens which have lived a long time in confinement, and have acquired abnormal colours in various parts of their plumage. The production of such coloured variations is, in fact, an art practised by the native tribes both in South America and in the Eastern Islands. Another cause of error is from young birds having been described; and a third, from the deficiencies of badly prepared native skins having been made up by the addition of parts (often the wings and tail) of other birds. In the present case I have little doubt that this bird is the *P. puniceus* of Gmelin, and the *Lorius amboinensis* of Brisson, whose description, generally so eminently accurate, appears to apply to a young bird which had lost its primary quills. I cannot agree to the revolution in nomenclature proposed by Mr. G. R. Gray, in using the names of Boddaert, which have been considered of no authority by every other author from the time of Gmelin to that of Prince Bonaparte.

TANYGNATHUS AFFINIS.

Viridis, subtus flavescens; capite saturate viridi; dorsi plumis cæruleo marginatis; crisso cæruleo; tectricibus alarum minoribus et mediis obscure viridibus, flavo marginatis, versus marginem et flexuram alarum viridi-cæruleis; majoribus cæruleo-viridibus, flavo-viridi marginatis; cauda subtus lutescente; culmine rostri versus basin biangulato.

Near *T. macrorhynchus*, Wagl.; but the under surface, and especially the sides of the breast and belly, have much less yellow; the shoulders and wing-coverts are dull greenish and blue instead of deep black, and only a few of the lesser wing-coverts are of a greenish black; the greater wing-coverts nearest the body are all green, and the yellow margins are much less conspicuous than in the allied species; the outer webs of the primaries and of the greater and middle wing-coverts are green, instead of blue as in *T. macrorhynchus*. The bill also differs, the culmen being much flattened in its basal half, with distinct angular edges, whereas in the allied species it is regularly rounded. Bill deep red; feet dusky olive; iris olive-yellow, with an outer ring nearly white.

Total length 17 inches; wing $9\frac{1}{2}$ inches; bill, to base, ♂ $2\frac{1}{8}$ inches, ♀ $1\frac{7}{8}$ inch.

Hab. Bouru, Amboyna, and Ceram.

Remarks.—The Amboyna and Ceram specimens have the wing-coverts a little darker than those from Bouru, but they are still sufficiently distinct from *T. macrorhynchus*.

TRICHOGLOSSUS CYANOGRAMMUS.

T. cyanogrammus, Wagl. Mon. Psitt. p. 554.

T. nigrogularis, G. R. Gray, P. Z. S. 1858, p. 183.

Hab. Bouru, Ceram, and all the Papuan Islands.

Remarks.—On examining specimens from the above-mentioned localities, I can find only slight individual variations among them, not confined to any given locality. The specimens from the Aru Islands (*T. nigrogularis*, G. R. Gray) exactly agree with the rest.

Eos rubra, var.

Psittacus borneus, L.
P. ruber, Gm., Wagl. Mon. Psitt. p. 558.
Hab. Bouru, Amboyna, Ceram, and Matabello Islands.

The specimens are rather smaller than those from Amboyna, and have more blue on the wing-coverts, and often a greenish tinge on the wings and tail, which makes them agree with the descriptions of *P. borneus* of the old authors. Might not Bouru have been mistaken for Borneo, and thus led to the erroneous name?

Note.—Besides the preceding five species of *Psittaci*, Bouru possesses also the *Aprosmictus amboinensis*; but as a specimen was not obtained by me, I have not included it in the present list.

Haliastur leucosternus.

Haliastur leucosternus, Gould, B. of Austr. i. pl. 4.
Hab. Bouru and the countries eastward.

Baza reinwardtii.

Lophotes reinwardtii, Schleg. & Müll. Verh. Ned. t. 5.
Hab. Bouru, the Moluccas, and Timor.

Accipiter rubricollis. (Pl. IV.)

Supra nigro-plumbeus, subtus albo-cinereus; nucha et colli lateribus late et intense rufis; genis cinereo-plumbeis; gula ventreque albescentibus; remigibus rectricibusque obscure fasciatis.

Above slaty black; beneath very pale ash, shading into nearly pure white on the throat, belly, and under tail-coverts. Back and sides of the neck extending between the shoulders deep red-brown, a lighter shade of which covers the sides of the breast; the wings and tail are crossed by obscure black bands, which on the lighter undersides of the feathers become distinct blackish bands, less visible on the outer tail-feathers. The under wing-coverts and the base and margins of all the quills beneath are of a light rufous-buff. Bill black, at the base plumbeous; cere, orbits, and feet yellow; iris golden yellow.

Length 14 inches; wing $8\frac{1}{4}$ inches; tail $6\frac{1}{4}$ inches; tarsus $2\frac{1}{8}$ inches; middle toe and claw $2\frac{1}{8}$ inches.

The young bird is dusky above, with the feathers rufous-margined; beneath creamy white, with broad dusky stripes down each feather.

Hab. Bouru, Ceram, and Gilolo.

Remark.—This bird resembles on its upper surface *A. erythrauchen*, G. R. Gray (P. Z. S. 1860, p. 344), but is very much larger. As the dimensions of that bird are wrongly printed, I will here correct them. Instead of "length 11′ 9″, wing 8′ 9″," as given, it should be, "length 10′ 9″, wing 6′ 9″"*.

* Since reading this paper, I have seeu Professor Schlegel's 'Catalogue of the Birds in the Leyden Museum,' part 1, in which (Astures, p. 39) he describes this bird under the name of *Nisus cirrhocephalus ceramensis*, which seems to be equivalent to making it a variety of *N. cirrhocephalus*. Considering, however, the

ACCIPITER CRUENTUS.

Astur cruentus, Gould, Birds of Austr. i. pl. 18.

Hab. Bouru and Timor.

ATHENE HANTU.

Rufa, supra rufo-brunnea; gula pallidiore; fronte genisque albescentibus; corpore subtus, cum cauda, rufescente et albescente indistinctissime fasciato; tectricibus alarum inferioribus rufis; remigibus fuscis, pogonio externo rufo; digitis tarsisque setulosis.

Above dark, beneath bright rufous; tail with very indistinct, narrow, paler bars; forehead, cheeks, and chin whitish; under surface indistinctly banded with narrow fasciæ of darker and lighter rufous or whitish; the under tail-coverts barred with rufous and whitish; quills not barred, except close to their bases; under wing-coverts rufous, not barred; third, fourth, and fifth quills equal; tarsi and toes densely clothed with bristles; bill whitish horn-colour; iris yellow; feet (in the living bird) white.

Length 12 inches; wing $8\frac{3}{4}$ inches; tail 5 inches.

This species resembles *A. squamipila*, Bp., in its hairy tarsi, but differs in its coloration and proportions; it is one of the "burong hantus" (ghost-birds) of the natives.

Hab. Bouru.

SCOPS LEUCOSPILUS.

Ephialtes leucospila, G. R. Gray, P. Z. S. 1860, p. 344.

Hab. Bouru and Gilolo.

CAPRIMULGUS MACROURUS.

C. macrourus, Horsf. Linn. Trans. xiii. p. 142.

Hab. Bouru and the whole archipelago.

DENDROCHELIDON MYSTACEUS.

Cypselus mystaceus, Less. Voy. Coquille, Ois. t. 22.

Hab. Bouru, Moluccas, and New Guinea.

Remark.—This is the limit of the range of this fine Tree-Swift to the westward. In the Sula Islands and Celebes it is replaced by *D. wallacii*, Gould.

CACOMANTIS ASSIMILIS.

Cuculus assimilis, G. R. Gray, P. Z. S. 1858, p. 184.

Hab. Bouru.

This specimen seems to agree with that named and described as

bird to be a very good species, I should at once have adopted Professor Schlegel's name *ceramensis*, had I not obtained the bird in other localities than Ceram. The *Raptores* having so generally an extensive range renders the application of territorial specific names less advisable in their case than in that of the *Passeres*. My own rule is only to apply the name of a country as specific name when the surrounding districts are known to possess their peculiar representative species, in which case it amounts almost to a certainty that the new bird is similarly restricted in range.

above; but these small Cuckoos vary so much in their plumage as to render it very difficult to decide. My specimens seem to show that the same species extends over Celebes, the Moluccas, and New Guinea; and it may be probably the same as *C. tymbonomus*, Müll.

EUDYNAMIS RANSOMI.

E. ransomi, Bp. Consp. Gen. Av. p. 101.

Mas ad. *nigro-violaceo nitens; rostro pallide viridi-olivaceo; pedibus plumbeis.*

The female and young male were described by Bonaparte. The adult male is, like others of the genus, entirely shining blue-black; iris crimson.

Total length 18–19 inches; wing 8–8½ inches; bill, to front, 1⅛ inch.

Hab. Bouru and Ceram.

CENTROPUS MEDIUS.

C. medius, Bp. Consp. Gen. Av. p. 108.

Bill black; feet blackish lead; iris olive-brown. In the immature bird the plumage above is pale rufous, banded and spotted with black; the tail bronzy black, with about sixteen rufous bands; the under surface yellowish, with small dark spots; the thighs and vent dusky; and the bill pale horn.

Length 18–19 inches; wing 7½–8 inches; bill, from gape, 1½ inch.

Hab. Bouru, Ceram, and Gilolo.

TODIRAMPHUS COLLARIS.

Alcedo collaris, Scop.; Sw. Zool. Ill. t. 57.

Hab. Bouru and the whole archipelago.

TODIRAMPHUS SANCTUS.

Halcyon sancta, Vig. & Horsf.; Gould, Birds of Austr. ii. pl. 21.

Hab. Bouru and the islands eastward.

TANYSIPTERA ACIS.

Supra nigra, subtus albo-rufescens, plumis tenuiter nigro marginatis; plumis pilei cæruleo marginatis, superciliis et corona occipitali magis cæruleis; tectricibus alarum minoribus cæruleis; uropygio albo; tectricibus caudæ superioribus albis, rufo tinctis et nigro marginatis; rectricibus mediis elongatis cæruleis, ad basin fusco et albo maculatis, spatulis albis cæruleo marginatis; aliis albis, externe fusco-cæruleo marginatis, interne albo et nigro maculatis; gula albescente; tectricibus caudæ inferioribus albis.

Forehead and crown black, with the feathers blue-margined; a band over the eyes and round the nape brighter blue; ear-coverts, back, and wings deep black, with the lesser wing-coverts blue-margined, margin of the wing blue-tinged; primaries with the outer webs pale-edged towards the tips; under surface of the body pale

buff, nearly white on the throat; the feathers of the breast and flanks with blackish lateral edges; rump white, feathers black-edged, the black increasing to the tail-coverts, the last of which have the outer web black; middle tail-feathers blue, with the bases irregularly white-striped, and the spatulate ends white, with bluish margins; lateral tail-feathers white, with blue margins to the outer webs, and irregular dusky markings on the inner webs. Bill orange-red; feet olive; iris dark.

Total length 14½ inches; wing 4 inches.

Hab. Bouru.

Remarks.—This interesting addition to the genus *Tanysiptera* is blacker on the upper surface than any of its allies. It is also remarkable for the buffy tint and black-edged feathers of the under surface,—characters which in the other species are confined to the young birds. My specimen is, however, in fine plumage and condition, and I have little doubt that these characters are distinctive of the adult bird.

Nine species of the genus have now been described; and a careful examination of the fine series of specimens in my collection having convinced me that they can all be clearly characterized, I will add a table of the species.

Table of the Species of Tanysiptera.

	Species.	Habitats.
I. With a white dorsal spot.		
1. Beneath cinnamon-red	1. *sylvia*	N. Australia.
2. Beneath white.		
A. Tail and upper tail-coverts blue-margined	2. *doris*	Morty Island.
B. Tail and upper tail-coverts white	3. *sabrina*	Kaioa Island.
II. No dorsal spot.		
1. Rump red	4. *nympha*	New Guinea.
2. Rump white.		
A. Ear-coverts and nape black.		
a. Outer tail-feathers black, blue-edged	5. *hydrocharis*	Aru Island.
b. Outer tail-feathers white, blue-edged	6. *acis*	Bouru.
B. Ear-coverts and nape dark blue.		
a. Eyebrows and nape lighter blue than the crown, terminal tail-coverts black.	7. *isis*	Batchian and Gil
b. Head uniform blue, tail-coverts all white.		
a. Back blue-spotted	8. *nais*	Amboyna, Ceram
b. Back uniform	9. *galatea*	New Guinea and Waigiou.

In this table I have altogether left out the Linnæan *Alcedo dea*, because it is possible we may yet obtain certain evidence as to which species it was applied to. The figure in the 'Planches Enluminées' and the careful description of Brisson agree best with *T. sabrina*, G. R. Gray; and I should have little hesitation in placing that name under *T. dea* as a synonym, but that specimens may yet arrive from Ternate—the locality given by the old authors. It is to be remarked, however, that Kaioa Islands, where I obtained *T. sabrina*, is the southernmost of a chain of islets extending up to Ternate, and nowhere more than eight or nine miles apart; so that it is very improbable there should be another species in that island. There can be

therefore, I think, but little doubt that *T. sabrina* is but an individual or local variety of the true *Alcedo dea*.

ALCEDO MOLUCCENSIS.

Alcedo moluccensis, Blyth, Journ. As. Soc. Bengal, 1847.
Hab. Bouru, Celebes, and Gilolo.

CEYX CAJELI. (Pl. V.)

Nigra, subtus rufo-lutea; capite et tectricibus alarum punctis parvis cæruleis ornatis; dorso et caudæ tectricibus pallide cæruleis; gula late alba; genis nigris aut tenuiter cæruleo striatis; flexura et margine alarum, colli et frontis maculis lateralibus rufis; rostro pedibusque dilute corallinis.

Above black; beneath rufous yellow; each feather on the head marked with a very small, subtriangular, light-blue spot; on the back and upper tail-coverts the outer half of each feather is whitish blue; chin and throat pure white; a frontal spot over each nostril, a patch behind the ears, and the bend and margin of the wing rufous; ear-coverts black, and the space below them either black or very finely striated with blue; bill and feet pale coral-red; iris dark.

Length 6 inches; wing $2\frac{3}{8}$ inches; bill, from front, $1\frac{3}{8}$ inch.
Hab. Bouru.

Remarks.—This species is very like *C. lepida*; but differs in the very small spots on the head and the stripe on the back being of quite a different blue colour, and also in the scapulars being entirely black, whereas in the other species they are tipped with rich blue. I have named this species after the town or fort of Cajeli in Bouru, to which island this pretty bird is most probably strictly confined.

EURYSTOMUS PACIFICUS.

Coracias pacifica, Lath.
Eurystomus australis, Gould, B. of Austr. ii. pl. 17.
Hab. Bouru and the islands eastward.

PITTA RUBRINUCHA.

Pitta rubrinucha, Wallace, P. Z. S. 1862, p. 187.
Hab. Bouru.

ACROCEPHALUS AUSTRALIS.

Acrocephalus australis, Gould, Birds of Austr. iii. t. 38.
Hab. Bouru.

Remarks.—My specimen agrees exactly with Gould's figure and description. I did not meet with the species in any other of the islands.

CISTICOLA RUSTICA.

Luteo-rufa; supra plumis medialiter nigris; subtus gula et abdomine medio albescentibus; rectricibus subtus rufo terminatis, macula subapicali nigra.

Rufous yellow; feathers of the head with a black stripe, of the

back and wing-coverts black with a rufous margin; quills dusky, the primaries narrowly, the secondaries and tertiaries more broadly rufous-margined; tail pale, rufous-tipped; the two middle feathers rufous, with the central part and towards the apex blackish, the rest black; beneath with the sides of the neck, the breast, the flanks, and the under wing-coverts and tail-coverts pale chestnut, becoming nearly pure white on the throat and the middle of the belly; quills beneath brownish black, narrowly margined with pale rufous towards the base; tail beneath dusky, the feathers with narrow margins and broader tips of pale rufous, and each with a large subapical black spot; bill dusky above, pale beneath; feet and claws pale yellowish; iris pale olive.

Total length 4 inches; wing $1\frac{7}{10}$ inch; tarsus $\frac{5}{8}$ inch.

Hab. Bouru.

Remark.—Very near *C. lineocapilla*, Gould, with which I had at first placed it; but comparison with a specimen in the British Museum has convinced me of its distinctness from any of the Australian species.

MIMETA BOURUENSIS.

Philedon bouruensis, Quoy & Gaimard, Voy. de l'Astrol. t. 8. f. 2.
Tropidorhynchus buruensis, Bp. Consp. Gen. Av. p. 390.

Cinereo-brunnea, subtus pallidior; facie et auriculis fusco-nigris; capite et gula substriatis; torque nuchali indistincto fulvo-cinereo.

Earthy brown; beneath whitish brown; head a little paler, the feathers marked with a central blackish stripe, and on the nape a narrow paler rufescent band; ear-coverts dusky black; lores and cheeks blackish, mixed with whitish; chin and sides of the throat with a dusky stripe on each feather; primaries outwardly edged with pale rufous; under wing-coverts and margins of all the quills beneath towards the base pale rufous or buff; under tail-coverts with a tinge of buff; rectrices, all but the middle pair, tipped on the inner web with the same colour; bill horny black; feet lead-colour; iris dull red.

Length 9 inches; wing $5\frac{5}{8}$ inches; tail $4\frac{3}{4}$ inches; bill, to front, $1\frac{1}{2}$ inch.

Hab. Bouru (Moluccas).

Remarks.—This curious bird resembles so closely a Honeysucker of the genus *Tropidorhynchus* that it has been figured and described as such, and even escaped the acute eye of Prince Bonaparte, who has given it that place in his 'Conspectus.' But, more singular still, there is a species of true *Tropidorhynchus* inhabiting the same island of Bouru, which so closely resembles this bird that the two can hardly be distinguished, except by a close comparison of the generic characters that separate them. We have here, in fact, a case among birds of that *mimicry* of one species by another belonging to a different group, which Mr. Bates has so well illustrated among the Lepidoptera of S. America (see Linn. Trans. vol. xxiii. p. 495). In this case the Oriole has imitated the Honeysucker; for it has de-

parted from the usual gay colouring of its allies, and is actually the dullest-coloured of its family, while the Honeysucker very much resembles in its coloration other species of the group to which it belongs. The imitation is carried to the minutest particulars: the bare black orbits of the *Tropidorhynchus* are copied by a patch of dusky feathers in the *Mimeta*; the rigid lanceolate feathers on the head of the former are imitated by dark stripes on the broader feathers of the latter; and even the very peculiar ruff of recurved feathers on the nape of the *Tropidorhynchus* has its general effect imitated by a collar of a pale colour in the *Mimeta*. The under and upper surfaces of the two birds are as near as possible of the same tint respectively; and, stranger still, the Oriole has closely copied the mode of flight and the voice of its model; so that in a state of nature the two birds are practically undistinguishable. Most of the species of *Tropidorhynchus* have an elevated keel or protuberance at the base of the bill. In the Bouru bird this is altogether wanting; yet in the *Mimeta* which copies it there is a slight protuberance at the base of the bill, which does not occur in any other species of its genus—almost making us think that some ancestors of the present bird had mimicked a species of *Tropidorhynchus* which possessed the protuberance, and that their descendant, finding himself in the company of a bird without this ornament, was gradually losing it, but had not yet quite done so. It has been observed by Mr. Bates, and is no doubt generally true, that mimicking species are much less abundant than those they copy. In the present instance it seems to be different; for I obtained many specimens of the *Mimeta* before I saw a single *Tropidorynchus*, though in other islands the latter was generally the most abundant. Perhaps in this case it has carried the imitation to such an extent as actually to gain an advantage over its model in the struggle for existence. This curious instance of mimicry does not stand alone; for in the adjacent island of Ceram, two allied but very distinct species (*Mimeta forsteni* and *Tropidorhynchus subcornutus*) resemble each other with equal accuracy. What peculiar immunity from danger the *Tropidorhynchi* possess, which makes it advantageous for other birds to imitate them, it is not very easy to see. In the case of insects, it seems probable that it is the odour or taste of the imitated species which is unpalatable to insect-eating birds; or, in other cases, like the clear-winged Moths which mimic Hymenoptera, the mimicked species are armed with a sting. In birds it is evident that the bravest, strongest, and best-armed groups should be the subjects of mimicry, and the weakest and most defenceless those which obtain some advantage by imitating them. Now this is certainly the case, for the *Raptores* are the most frequent subjects of imitation—a Parrot (*Strigops*) imitating an Owl, some Curassows of the genus *Ibycter* resembling Hawks (Ibis, vol. ii. p. 223), and Cuckoos frequently resembling Hawks. A species was named by Temminck *Falco cuculoides*; and in all parts of the world the larger grey and banded Cuckoos are mistaken by the natives for Hawks. Cuckoos, however, which are certainly among the weakest and most defenceless of birds, imitate several

other groups, especially Gallinaceæ,—for example, *Centropus phasianus* in Australia, and *Carpococcyx radiatus* in Borneo, which latter is terrestrial in its habits, and much resembles the *Euplocami* of the same island. *Eudynamis* also frequently resembles Pigeons, especially the females and young birds, which are banded like *Macropygia*. Among the small Cuculinæ some are very like *Campephagæ*; and *Chrysococcyx* has put on the metallic plumage of *Lamprotornis*.

Returning now to *Mimeta* and *Tropidorhynchus*, we have to observe that the former is a smaller, weaker, less active, less noisy, and less pugnacious bird; the feet have a less powerful grasp, and the bill is less acute. The latter has a great variety of loud and piercing notes, which bring its companions to the rescue in time of danger; and I have observed them drive away crows and even hawks which had ventured to perch on a tree where two or three of them were feeding. The *Tropidorhynchus* knows how to take care of himself, and make himself both respected and feared; it would therefore evidently be to the advantage of the more defenceless *Mimeta* to be mistaken for him.

In this instance, as in most others, the imitation is far closer in the living bird than in the dead specimens, and it is a far more satisfactory case of mimicry than any of those which I have alluded to as occurring among birds, and which are more or less general resemblances to another group; while here we have two *species*, each confined to a single island, and each accurately imitated by a bird of a distinct family, with which it has no direct affinities.

I therefore cannot doubt that this is a true case of mimicry, exactly analogous to that so common among insects, and which my friend Mr. Bates has the honour of having first brought under the same general laws which have regulated all variation in the organic world.

Criniger mysticalis.

Viridi-olivaceus; subtus flavo-virens; gula crissoque flavescentibus; mento, loris et palpebris flavis; remigum pogonio interno fusco-nigro; cauda immaculata.

Entirely olive-green, more yellow-tinged beneath, especially on the throat and under tail-coverts; the lores, chin, and eyelids are pure yellow, and also the basal half of the gape-bristles; bill horny black; feet lead-colour; iris red.

Total length 9 inches; wing 4¼; bill to gape 1 inch.

Hab. Bouru.

Remarks.—This species is nearest to *Criniger simplex*, from Gilolo (Ibis, 1862, p. 350); but is at once distinguished by the markings of the face and the remarkable half-yellow gape-bristles.

Artàmus leucogaster.

Lanius leucogaster, Val. Ann. Mus. H. Nat. iv. t. 7. f. 2.

Hab. Bouru and the whole archipelago, from Sumatra to New Guinea.

Remarks.—From the large specimens of N. Celebes to the small ones of Timor and New Guinea there is such a gradation of size in

the various islands that it is impossible to separate birds which otherwise agree exactly in form and coloration. *A. papuensis*, Bp. Consp. p. 344, will have to be considered as a very slight local variety of the present bird.

HIRUNDO JAVANICA.

Hirundo javanica, Lath., Temm. Pl. Col. 83. f. 2.
Hab. Bouru and the islands westward.

MYIAGRA GALEATA.

Myiagra galeata, G. R. Gray, P. Z. S. 1860, p. 352.
Hab. Bouru and the Moluccas.
Remarks.—The only two specimens procured are ashy above, with faint signs of glossy blue and rufous white beneath; they probably show the immature plumage of the species, of which I have specimens from Ceram and the small islands east of it, and also from Morty, north of Gilolo.

MONARCHA LORICATA. (Pl. VI.)

Nigro-chalybea, subtus alba; mento gulaque squamatis, nigro-chalybeis; cauda alba, rectricibus mediis nigris, duabus utrinque juxta medium nigro terminatis; rostro pedibusque cæruleo-plumbeis.

Blue-black; beneath pure white, except the throat, which is covered with scaly feathers of a rich metallic blue-black; this colour meets the black of the upper parts at the angle of the mouth, and extends in an oval shield to the bottom of the neck; under wing-coverts white; tail with the three lateral feathers on each side entirely white, the next two black-tipped, and the middle pair entirely black, with occasionally some white touches on the outer webs; bill and feet lead-blue; iris dark.

The sexes are alike; in the young bird the white is replaced by pale reddish brown, and the black by fuscous brown.

Total length 7 inches; wing $3\frac{1}{2}$ inches.

Hab. Bouru Islands (Moluccas).

Remarks.—This beautiful species is nearly allied to *M. leucura* of Mr. G. R. Gray, which I sent from the Ké Islands, east of Ceram.

RHIPIDURA TRICOLOR.

Musicapa tricolor, Vieill. N. Dict. Hist. Nat. xvi. p. 490.
Hab. Bouru, Moluccas, and New Guinea.

RHIPIDURA BOURUENSIS.

Fusco-plumbea; capite nigro, ventre pallide rufo, alis caudaque fuscis; gula albescente, pectoris maculis elongatis albis; stria supraoculari occulta, alba; tectricibus majoribus pallide terminatis, remigibus ultimis pallide marginatis; rectricum duarum externarum pogonio externo rufo-albo.

Dusky lead-colour, deepening on the head to black; wings and

tail dusky brown; feathers of the throat somewhat decomposed, with the outer half white; those of the breast with an elongate oval white spot on each feather; middle of the belly, the vent, and under tail-coverts pale rufous; over the eye is a silvery-white mark, only visible when the feathers are raised; the under wing-coverts are tipped with pale rufous, the outer row with white; the greater wing-coverts above have the extreme apex whitish, the tertiary quills have a very narrow pale-rufous edging; the tail is immaculate, with the exception of the two outer quills, which have their outer web for its whole length rusty white; bill black; feet dusky; iris dark.

Length 7 inches; wing $3\frac{3}{8}$ inches; tail $3\frac{1}{2}$ inches; bill, to front, $\frac{1}{2}$ inch.

Hab. Bouru.

Remarks.—I have named this species after the island it inhabits, because the allied forms from the surrounding islands being already known, there is every probability of its never being found anywhere else.

Pachycephala lineolata.

Pachycephala lineolata, Wallace, P. Z. S. 1862, p. 341.
Hab. Bouru and Sula Islands.

Pachycephala rufescens.

Pachycephala rufescens, Wallace, P. Z. S. 1862, p. 341.
Hab. Bouru and Sula Islands.

Pachycephala clio.

Pachycephala clio, Wallace, P. Z. S. 1862, p. 341.
Hab. Bouru and the Sula Islands.

Remarks.—The Bouru specimens have a more yellow tinge on the back, and the black pectoral band is generally broader than in those from Sula. I may here observe that the fine species from Batchian and Ternate, included in Mr. G. R. Gray's list of Molucca birds as *P. melanura*, Gould, is quite distinct from that species, and may be recognized by its black chin and upper tail-coverts, and narrow black crescent on the breast entirely disconnected from the black head, and also by its much larger size. We have therefore in the Moluccas four species of *Pachycephala* allied to the *pectoralis* and *melanura* of Australia, viz. *P. macrorhyncha*, Strickl., in Amboyna and Ceram, *P. calliope*, Bp., in Timor, *P. clio* in Bouru and Sula, and *P. mentalis*, n. s., in Batchian, Ternate, and Gilolo*.

* Pachycephala mentalis, n. s. *P. flavo-olivacea; capite, genis mentoque nigris; gula late alba; lunula pectorali nigra; subtus cum torque nuchali vivide flava; cauda ejusque tectricibus superioribus nigris; remigibus fusco-nigris, primariis olivaceo limbatis, aliis tectricibusque alarum flavo-olivaceo marginatis; rostro nigro, pedibus fusco-olivaceis.*
Long. 7, alar. 3·7, caudæ 2·10, poll. et duodecim.
Hab. Ins. Batchian et Gilolo.
This may be *Turdus armillaris*, Temm., or *Lanius cucullatus*, Licht. (Bp. Consp. p. 328); but I can find no descriptions of those species, and therefore give this bird a name descriptive of a peculiarity confined to it. *Laniarius albicollis*, Vieill., is different from this and apparently from any other described species.

DICRURUS AMBOINENSIS.

Dicrurus amboinensis, G. R. Gray, P. Z. S. 1860, p. 354.
Hab. Bouru.
Remark.—The specimens are rather larger and better-coloured than those from Amboina and Ceram, but otherwise agree with them.

CAMPEPHAGA MARGINATA.

Supra plumbea, subtus albo-cinerea; loris fusco-nigris; tectricibus caudæ et alarum inferioribus albis; remigibus et tectricibus alarum majoribus nigris, albo marginatis; rectricibus extimis utrinque tribus albo terminatis.

Bluish lead-colour above, ashy white beneath; base of wings beneath and under tail-coverts white; wings and tail black; primaries white-margined on the inner web near the base; secondaries, tertiaries, and greater wing-coverts white-margined towards the points; middle tail-feathers ashy, with a black tip, outer ones with the outer margin and tip ashy, the next two with diminishing ashy tips; bill and feet black; iris dark.
Total length $8\frac{1}{2}$ inches; wing $4\frac{1}{4}$ inches.
Hab. Bouru.
Remarks.—This species somewhat resembles *C. plumbea*, but is smaller and paler beneath, and the bill is more slender.

TROPIDORHYNCHUS BOURUENSIS.

Cinereo-brunneus, subtus pallide cinereus; gula et capitis lateribus plumis subrigidis subsericeis; alis caudaque subtus fuscis; rectricum lateralium utrinque duarum apicibus tenuiter fulvescentibus; facie nuda nigra; protuberantia ad basin rostri nulla.

Above ashy brown; head somewhat paler, with lanceolate feathers, the stems of which are black; beneath pale ashy; the plumes of the throat and upper part of the breast and the marginal feathers of the head and face somewhat rigid, of a silky lustre, and with darker stems; quills dusky, with the inner margins of a paler fulvous tinge; tail uniform dusky, the two outer feathers on each side with the apex on the inner side of paler fulvous colour; orbits and cheeks bare, black; bill black, without any protuberance at the base; feet pale lead-colour; iris light olive.
Length $14\frac{1}{2}$ inches; wing 6 inches; tail $5\frac{1}{2}$ inches; bill, to front, $1\frac{3}{4}$ inch.
Hab. Bouru.
Remarks.—This species is the subject of imitation by a bird of quite distinct family (Oriolidæ), as fully explained under *Mimeta bouruensis*, which bird is the *Tropidorhynchus bouruensis*, Bp., ex Lesson.

ZOSTEROPS CHLORIS.

Zosterops chloris, Bp. Consp. Gen. Av. p. 398.
Hab. Bouru, Ternate, and Banda.
"Iris pale brown; bill dusky black above; beneath and feet lead-colour."

DICÆUM ERYTHROTHORAX.

Diceum erythrothorax, Less. Voy. Coquille, Ois. t. 30. f. 1, 2.
Hab. Bouru.

Remark.—An allied species to this occurs in Ceram, of which I give the description in a note*.

NECTARINIA PROSERPINA.

Purpureo-nigra velutina; capite viridi-chalybeo; gula purpureo-violacea metallica; crisso, tectricibus caudæ superioribus et alarum minoribus purpureo-cyaneis; remigibus fusco-nigris; cauda elongata, rectricibus duabus mediis purpureo marginatis.
♀. *Supra olivaceo-viridis, subtus flavescens; capite pectoreque cinereis; cauda fuscescenti-nigra, apice pallida.*

Rich velvety purple-black; crown greenish steel-blue; throat richly scaled with violet-purple; wings, with the lesser coverts only, the rump, and upper tail-coverts metallic-blue; two middle tail-feathers margined on both sides with purple; wings and tail fuscous black.

Female.—Above olive-green; the crown and nape dark ash, each feather having a central dusky spot; beneath pale olive-yellow, the throat and breast light ash; quills dusky, with an outer margin of olive-yellow; tail purplish-black, the feathers margined on the outer web with olive-green, and a whitish spot on the inner web at the apex, increasing in size from the middle to the outer feathers.

Length 5 inches; wing $2\frac{1}{3}$ inches; tail $1\frac{1}{2}$ inch; bill, from front, $\frac{3}{4}$ inch.

Hab. Bouru.

Remark.—This beautiful species is like *N. aspasia*, but differs in its middle and greater wing-coverts being purple-black and not metallic, and in the longer tail.

NECTARINIA ZENOBIA.

Cinnyris zenobia, Less. Voy. Coq.
C. clementiæ, Less. Man. d'Orn. ii. p. 40.
Hab. Bouru, Amboyna, Ceram, and Ké Islands.

CALORNIS OBSCURA.

Lamprotornis obscura, Bp. (ex Forsten) Consp. Gen. Av. 417.
Hab. Bouru and the other Moluccas.

* DICÆUM VULNERATUM.

Supra æneo-fuscum, subtus cinereum; abdomine albescente; macula parva pectorali tectricibusque caudæ superioribus rubris.
Fem. *immaculata.*

Above dark fuscous brown, with a bronzy tinge; beneath light ashy, becoming nearly white on the belly and vent; a small round patch on the breast and the upper tail-coverts bright red; under wing-coverts and sides of breast white; bill black, bluish at the base; feet black. The female (?) or young bird is rather lighter on the upper and darker on the under surface than the male, has no red spot on the breast, and the upper tail-coverts are reddish olivaceous.

Total length 3 inches; wing 2 inches.
Hab. Ceram.

MUNIA MOLUCCA.

Loxia molucca, L.; Pl. Enl. 139. 2.
Hab. Bouru and the Moluccas.

TRERON AROMATICA.

Columba aromatica, Gm.
C. viridis amboinensis, Br. Orn. i. p. 146; Pl. Enl. 163 (fig. pessima).

Bill, cere, and eyelids pale dull blue, tip of the bill becoming yellow in dry specimens; iris white; feet dusky purple.
Total length 11½ inches; wing 6 inches.
Hab. Bouru, and probably Amboyna and Ceram.
Remarks.—Brisson's description of this species is most accurate, and, with the bird before one, cannot be mistaken. The figure in the 'Planches Enluminées' is abominable, but no doubt applies only to this bird. Gmelin copies Brisson; but makes an error which would prevent one recognizing the bird, in saying that "the *upper* tail-coverts are sordid white," instead of the *lower*. This bird is the true *Treron aromatica* (as being an inhabitant of the Spice Islands), a name which has been applied to birds of distinct species from India, Sumatra, and the Philippine Islands. It is easily distinguished from all its allies by having the top of the head ashy blue, not reaching below or even to the eyes, by the broad yellow bands on the wings, and by the under tail-coverts being nearly pure white in *both sexes*.

CARPOPHAGA MELANURA.

Carpophaga melanura?, G. R. Gray, P. Z. S. 1860, p. 361.
Hab. Bouru and all the Moluccas.
Remarks.—This species is certainly distinct and peculiar to the Moluccas, *C. luctuosa* being found only in Celebes on the west, and *C. bicolor* in the Papuan Islands to the east of it. Bill greenish horn-colour; tip greenish yellow; feet lead-colour; iris nearly black.

CARPOPHAGA PERSPICILLATA, var.

Columba perspicillata, Temm. Pl. Col. 246.
Hab. Bouru, Batchian, Gilolo, and Waigiou Islands.
Remarks.—The true *C. perspicillata* of Temminck is probably that of the islands of Ceram and Amboyna, which has the head and neck of nearly the same whitish ash as the under surface of the body, and the quills of a powdery-ash tint; whereas in the specimens from the Northern Moluccas and Bouru the head and sides of the neck are slate-colour, the throat and breast slaty ash, and the quills purple-black, with a slight ashy tinge. The bill is bluish, pale at the tip, and red at the base; the feet pale purple, and the iris brown-black.
This variety is constant and easily distinguishable, and will probably be considered a distinct species by many naturalists; and it is only the absence of any perceptible difference in the form or proportions, or of any definite markings which can be more clearly characterized than shades of colour, which prevents me classing it as such.

PTILONOPUS PRASINORRHOUS.

Ptilonopus prasinorrhous, G. R. Gray, P. Z. S. 1858, p. 185.

Bill and its base, as far as the eye, gamboge-yellow; iris orange-brown, with an inner ring of yellow; feet dull purple.

Length $9\frac{1}{2}$ inches; wing $4\frac{3}{4}$ inches.

Female entirely green; crown of head very rich green; underside rather duller; under tail-coverts yellow-margined.

Hab. Bouru, Matabello, Goram, and Ké Islands, belonging to the Molucca group; also Mysol and Waigiou, of the New Guinea group.

PTILONOPUS VIRIDIS.

Columba viridis, L., Pl. Enl. 142.

Bill yellow, the base red; iris yellowish red; orbits yellow; feet red.

Total length 9 inches. The male and female are alike.

Hab. Bouru, Amboyna, Ceram, and Goram.

MACROPYGIA AMBOINENSIS.

Columba amboinensis, L., Bp. Consp. Gen. Av. ii. p. 56.

Hab. Bouru and the other Moluccas.

"Bill black; iris pearly white, with an outer ring of pink; feet coral-red."

CHALCOPHAPS MOLUCCENSIS.

Chalcophaps moluccensis, G. R. Gray, P. Z. S. 1862, p. 345.

Hab. Bouru, Sula Islands, and the Moluccas.

MEGAPODIUS WALLACII.

Megapodius wallacei, G. R. Gray, P. Z. S. 1860, p. 362, pl. 171.

This species differs somewhat in its habits from the other members of the family found in the Malay Islands. It resides generally in the hilly districts of the interior, like *Megacephalon maleo*, and, like that species, comes down to the beach to deposit its eggs; but instead of scratching a hole for them and covering it up again, the bird burrows into the sand to the depth of 3 or 4 feet obliquely downwards, and deposits its egg at the bottom. It then loosely covers up the mouth of its hole; and is said by the natives to obliterate and disguise, by innumerable tracks and scratches, its own footmarks leading to the hole. Its offspring is then left to make its way into the world as it best can. The only specimen I obtained here was caught on the beach, at the mouth of its burrow, early one morning. Its wing was broken and wounded at the outer joint, as if it had been attacked by some small animal when in its burrow, probably a rat.

Hab. Bouru, Gilolo, and Ternate.

MEGAPODIUS FORSTENI.

Megapodius forsteni, Gray & Mitch. Gen. of Birds, iii. pl. 124.

Hab. Bouru, Amboyna, and Ceram.

This bird deposits its eggs in a heap of rubbish collected in low places near the sea. It is seminocturnal in its habits, making a loud wailing cry, which is often heard at night and about daybreak.

GLAREOLA GRALLARIA.

Glareola grallaria, Temm.
G. australis, Leach, Linn. Trans. xiii. pl. 14.
Hab. Bouru and Australia.

ESACUS MAGNIROSTRIS.

Charadrius magnirostris, Lath., Temm. Pl. Col. 387.
Hab. Bouru, Celebes, and New Guinea.

NUMENIUS UROPYGIALIS.

Numenius uropygialis, Gould, B. of Austr. vi. pl. 43.
Hab. Bouru, the Moluccas, and New Guinea.

BUTORIDES JAVANICUS.

Ardea javanica, Horsf. Linn. Trans. xiii. p. 190.
Hab. Bouru and the whole archipelago.

ARDETTA FLAVICOLLIS.

Ardea flavicollis, Lath. Ind. Orn. ii. p. 701.
Hab. Bouru, and from India to Australia.

NYCTICORAX CALEDONICUS.

Ardea caledonica, Gm.: Gould, B. of Austr. 6. t. 63.
Hab. Bouru, Moluccas, and Australia.

GALLINULA FRONTATA.

Fusco-plumbeo-nigra; dorso alisque olivascentibus; cauda nigra; tectricibus caudæ inferioribus lateralibus albis, mediis nigris; rostro rubro, apice abrupte luteo; clypeo frontali magno, dilatato, supercilia attingente; pedibus rubris, fusco articulatis, tibiis subtus olivaceis.

Very near *G. tenebrosa*, Gould, but distinguishable from that species by the differently-coloured back and wings, which are olivaceous brown instead of black, the rather slenderer bill, the very large frontal plate, and the more uniform-coloured legs, the joints of the tibiæ and tarsi being dusky olive, the median line of the tibiæ beneath olive-green, the tarsi beneath dusky lead-colour; the lateral under tail-coverts pure white, the middle ones black; the rest of the plumage of a dusky lead-colour, deepening on the top of the head and neck to nearly black, and on the breast tinged with brown; wings brownish olive; tail black.

Total length 13 inches; wing 7 inches; bill, from back of frontal plate, 2 inches.

Hab. Bouru.